

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Art Unit : 1765
Examiner : John M. Cooney
Appellants : Thomas M. Kurth et al.
Serial No. : 09/944,212
Filed : August 31, 2001
Confirmation No. : 2406
For : **TRANSESTERIFIED POLYOL HAVING SELECTABLE AND INCREASED
FUNCTIONALITY AND URETHANE MATERIAL PRODUCTS FORMED USING
THE POLYOL**

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

APPLICANT'S REPLY UNDER 37 C.F.R. § 1.193

This brief is in reply to the Examiner's Answer dated as mailed October 14, 2010.

Item (1):

The Examiner has no comment on this statement in the Appeal Brief.

Items (2-3):

The Examiner appears to have agreed that these items are acceptable as listed in the Appeal Brief.

Items (4-5):

The Examiner has no comment on these statements in the Appeal Brief.

Item (6):

The Examiner has withdrawn all rejections under 35 U.S.C. §112, 1st Paragraph as addressed in the Appeal Brief.

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Item (7):

The Examiner has no comment on this statement in the Appeal Brief.

Item (8): Evidence Relied Upon

The Examiner has correctly listed the references used to reject the claims in the present application.

Items (9 and 10) Reply to Examiner's Grounds of Rejection and Arguments:

The Appellants' Appeal Brief stands, and is incorporated herein in its entirety.

Rejection of Claims 83-108 Under 35 U.S.C. § 103(a)

The rejection of claims 83-108 under 35 U.S.C. § 103(a) was maintained in the Examiner's Answer mailed October 14, 2010 as being unpatentable over Croft (U.S. Patent No. 5,688,860) in view of Burke (U.S. Patent No. 4,185,146) and Trowell (U.S. Patent No. 4,720,571) (Examiner's Answer pages 3-9).

Specifically, the Examiner's Answer states "Croft discloses polymer materials comprising the reaction product of isocyanates, isocyanate reactive materials, catalysts, plasticizers, extenders/crosslinkers, and other materials of Appellants' claims" (Examiner's Answer, p. 4). The Examiner then admits that "Croft differs from Appellants' claims in that it does not employ blown vegetable oil in its preparation." The Examiner then states that "Burke... discloses blown vegetable oils, including soya oils, to be well known materials used in urethane applications," and later states that transesterification catalysts are "well known to the polyurethane foam forming art," identifying Trowell as a reference while admitting that the employment of transesterification catalysts is not taught by Croft. (Examiner's Answer, p. 5).

Appellants submit that the combination of the three references noted above is tenuous at best and does not present a prima facie case of obviousness as proffered by the Examiner.

Essentially, the Examiner's rejection boils down to this. In the Examiner's opinion, Croft describes a urethane reaction product (actually a polyurethane/urea viscoelastic elastomer) produced using a litany of different reactive compounds. This is supplemented by the Examiner's observation that Burke discusses blown soya oil to be "well known" materials used in urethane applications. In fact, the passage relied upon by the Examiner is a reference in the background of the Burke reference to U.S. Patent No. 2,833,730 that supposedly describes creation of a cellular plastic foam¹. The remainder of the Burke reference actually makes no mention of the use of blown vegetable oils. The '146 patent to Burke is directed to the incorporation of a soybean derivative (a fine powder), which is used to decrease costs in a more traditional petroleum polyalkylene ether polyol urethane material. Finally, Trowell is relied upon solely for teaching that transesterification catalysts are known.

The present rejection of the claims as obvious is improper for a variety of reasons. Most significantly, the references of the present rejection do not disclose or suggest all the elements of the claims. There is no prior art teaching cited by the Examiner in making the rejection that discusses a transesterified product produced from a blown palm oil, a blown safflower oil, a blown canola oil, a blown soy oil, a blown cottonseed oil, or a blown rapeseed oil and a polyol component with a plurality of hydroxyl groups, let alone in the amount and at the other conditions of the claims (claim 101). Still further distanced from this is any reference

¹ The '730 patent is non-enabling as discussed in the Appeal Brief and evidenced by the Declaration of John Peldonia.

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to the use of the similarly claimed transesterified polyol as a reactive polyol component on the urethane material of claim 83.

During examination, the Examiner bears the initial burden of establishing a prima facie case of obviousness. *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992). “[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *KSR Int’l v. Teleflex, Inc.*, 550 U.S. 398, 418 (2007) (quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)). “[T]he analysis that ‘should be made explicit’ refers not to the teachings in the prior art of a motivation to combine, but to the court’s analysis.” *Ball Aerosol & Specialty Container, Inc. v. Ltd. Brands, Inc.*, 555 F.3d 984, 993 (Fed. Cir. 2009). In order to establish a prima facie case of obviousness, the Examiner must show that each and every limitation of the claim is described or suggested by the prior art or would have been obvious based on the knowledge of those of ordinary skill in the art. *In re Fine*, 837 F.2d 1071, 1074 (Fed. Cir. 1998).

In making the present rejection, the Examiner simply concludes:

As to the employed amounts of this respective component, it has long been held that where the general conditions of the claims are disclosed in the prior art, discovering the optimal or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233; *In re Reese* 129 USPQ 402. Similarly, it has been held that discovering the optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*. 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

(Examiner’s Answer at page 4).

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In this case, the rejection does not even identify where transesterification of the particularly claimed blown vegetable oil polyols is discussed in the art, let alone what factors are or are not result effective variables.

In addition, the Examiner also concludes:

Difference based on the ranges of A-side to B-side ratios
{isocyanate Index values} is not seen.

(Examiner's Answer at page 4). This statement appears to be an attempt to reject dependent claims 84 and 85. Significantly, the Examiner has not cited where the art discloses these elements. Instead, the mere conclusion is stated that differences are not seen. As discussed above, the analysis should be made explicit and is improper for failing to do so.

In responding to the arguments presented in Appellants' Appeal Brief, the Examiner notes that "one cannot shown non-obviousness by attacking references individually where the rejections are based on a combination of references, citing *In re Keller*, 642 F2d 413 (CCPA 1981); *In re Merck & Co.*, 800 F2d 1091 (Fed. Cir. 1986). In *In re Keller*, the court found that a rejection based on a combination of three references was not overcome by Appellants' attack of a single reference alone. In *In re Merck & Co.*, the Federal Circuit upheld a finding that the reference in question taught that two modified compounds were interchangeable and possessed similar biological properties. These cases are distinguishable from the present case in that here, Appellants are showing that all the references are flawed as a combination such that one of ordinary skill would not combine these references with any expectation of success. The present case does not involve like components that suggest they are interchangeable, nor does this case involve the mere ineffectiveness of a single reference. This case involves an

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incomplete and improper combination of three references based upon hindsight which Appellants hereby traverse.

On pages 6 and 7 of the Examiner's Answer, the Examiner notes that the plasticizer of Croft is "an additional additive/auxiliary component which is not excluded by the limitations of Appellants' claims . . . It remains evident that Croft's additional inclusion of plasticizers, including vegetable oil plasticizers, does not serve to nullify the instant rejection because Appellants' claims do not exclude the inclusion of these additional materials of Croft."

Appellants' note that, even if the plasticizer as disclosed in Croft is "an additional additive/auxiliary component", the Croft reference does not mention any one of the blown vegetable oils as found in claims 83 and 101 of the present application for use as a reactive isocyanate component. In fact, the only time Croft mentions a vegetable oil found in claims 83 and 101 is when that vegetable oil (a non-blown soybean oil) is employed in the process disclosed in Croft as a plasticizer, as previously noted by Appellants.

In the table found in columns 13-18 of the '860 patent, Croft mentions 59 different materials having various descriptions and function identifications. The identified functions of the various materials include isocyanate, blocked isocyanate, polyamine crosslinking agent, alcohol crosslinking agent, plasticizer, polymer polyol crosslinking agent, microsphere filler, microsphere filler expanding, filler, catalysts, and antioxidant. In this chart, none of the vegetable oils as found in claims 83 and 101 are identified as isocyanate reactive materials. In this chart, soybean oil is again identified as a plasticizer. Thus, one of ordinary skill in the art reviewing this chart of various materials and various functions would note that soybean oil,

even listed among isocyanate reactive materials, is identified therein as a plasticizer. Moreover, there is no mention of a blown vegetable oil polyol let alone transesterifying such a polyol with another polyol. Thus, Appellants contend that it is simply too far of a logical leap to think that one of ordinary skill in the art would think that a substance identified as an inert plasticizer in the Examiner's primary reference could be wholly modified into an isocyanate reactive material if blown and transesterified as presently claimed, and substituted for the isocyanate reactive material of Croft.

The unpredictable nature of this art is demonstrated by the Croft reference itself. In fact, Table 1, as noted below, is a table from the '860 patent wherein various materials are combined to form urethane materials with unsatisfactory results. Specifically, the various materials are comprised of two isocyanates, eight alcohol crosslinking agents, four catalysts, and one plasticizer. The examples in Table 1 are listed as comparative examples C1 through C7 and represent seven combinations of various functional materials in varying isocyanate ratios and varying polyol ratios of linear and branched polyols, all of which resulted in unsatisfactory viscous liquids. As mentioned in column 17, lines 45-46 of the '860 patent, the Patentee notes "Solid viscoelastomers were not produced at isocyanate indices below the limits." (emphasis added). The Patentee goes on to note that:

The various polyols used in these experiments had functionalities ranging from 2 to 4, and thus were linear and branched, with primary and secondary alcohols having varying molecular weights. None of the comparative examples yielded solid elastomers, rather viscous liquids where formed in all cases.

('860 Patent, Col. 17, lines 52-57.)

TABLE I

Components	C1	C2	C3	C4	C5	C6	C7
Mondur CD	12.8	15.2	—	—	—	—	—
Vestanat IPDI	—	—	7.5	4.6	7.2	3.2	13.8
ArcoI PPG2025	59.0	62.7	67.5	—	86.5	—	52.8
ArcoI PPG425	26.2	—	—	—	—	—	—
Pluracol TP440	—	20.9	—	—	—	—	—
Castor Oil	—	—	24.0	—	—	—	—
Poly bd R45HT	—	—	—	94.4	—	—	—
Pluracol PEP550	—	—	—	—	5.3	—	—
ArcoI LHT-34	—	—	—	—	—	95.8	—
Quadrol	—	—	—	—	—	—	26.4
Polycat 33LV	2.0	0.4	—	—	—	—	—
Polycat SA-102	—	0.8	—	—	—	—	—
BiCat 8	—	—	1.0	1.0	1.0	1.0	—
Dabco F-12	—	—	—	—	—	—	0.2
Hatco DOP	—	—	—	—	—	—	6.8
Isocyanate Ratio	48.8	50.4	50.5	49.1	50.3	49.9	29.9
Polyol ratio: linear/branched (by equivalent)	All linear	1.00/2.36	1.00/1.09	All branched	1.00/0.49	All branched	1.00/6.86
Result:	Viscous Liquid	Viscous Liquid	Viscous Liquid	Viscous Liquid	Viscous Liquid	Viscous Liquid	Viscous Liquid

Table 1- '860 Patent, Col. 20.

Thus, given the failed nature of the above comparative examples, Appellants contend that the Croft reference demonstrates the unpredictability of this art even when using well known isocyanate reaction materials that are fabricated and much more consistent than the more variable natural vegetable oils. The Croft reference itself demonstrates the difficulties of producing such products and belies the truth of a blanket assertion that one can just substitute any polyol, such as the blown soybean oil of Burke, for the polyols of Croft.

Croft cannot be combined with the teachings of Burke with any reasonable expectation of success for at least another reason. The Examiner points to column 1, lines 26-33 of Burke as disclosing blown vegetable oils to be well known materials used in urethane applications. However, the Burke reference at column 1 lines 26-33 incorporates by reference U.S. Pat. No. 2,833,730, which has proven to be a nonenabling reference. (See the Declaration of John G. Peldonia as presented with Appellants' Appeal Brief). When the procedures disclosed in

Example 4 of the '730 patent are followed, the intermediate result is a solid mass that cannot be mixed with water and a diethanol amine catalyst as called by the final steps of the procedure disclosed therein. Quite simply, there is no teaching or suggestion to transesterify the particularly claimed blown vegetable oils containing reactive hydroxyl groups with another polyol (by heating or the use of a transesterification catalyst) and use the resultant transesterified polyol, which has further enhanced hydroxyl functionality, as a B-side reactive polyol in a urethane reaction to form a urethane material.

The Examiner has now argued that "appellants' narrow demonstration of the inoperability of a specific embodiment of the referenced Barthel Jr.'s teaching from Burke does not negate what is disclosed by its fully considered disclosure." (Examiner's Answer, p.8). However, reviewing the examples as found in Barthel Jr., it is readily apparent that the inoperability of Example 4 is indeed representative of the entire disclosure of Barthel Jr. Example 4 of Barthel Jr. describes the making of a urethane material "using the same procedure as in Example 1." ('730 Patent, Col. 5, ll 43-45). This is true for all 9 examples found in Barthel Jr. If all 9 examples require the inoperable teachings of Example 1, then Appellants contend that none of these examples could have been mixed with water in this 2-step process such that the entirety of this reference is inoperative. Thus, Appellants contend that the inoperability of this reference would have deterred one of ordinary skill in the art from combining the teachings of Burke with Croft and Trowell in forming a urethane material

The Examiner cited the Trowell reference as teaching that the employment of a transesterification catalyst in the polyurethane foam forming art is known. Appellants note,

this reference does not teach that a transesterification catalyst can be or should be used to transesterify a blown vegetable oil to create a selectively functional polyol. In fact, this reference strictly teaches that scrap polyethylene terephthalate (PET) can be used in the transesterification process disclosed in Trowell. There is no suggestion that the transesterification process disclosed in Trowell can be used with a blown vegetable oil nor any suggestion that the process as disclosed in the '571 patent to Trowell is a standardized process which can be successfully employed with any other reaction mixture other than a reaction mixture comprising scrap PET.

Conclusion:

The Examiner has simply not shown that there was a suggestion to transesterify the particularly claimed blown vegetable oils, namely a blown palm oil, blown safflower oil, a blown canola oil, a blown soy oil, a blown cottonseed oil, or a blown rapeseed oil and another polyol as noted in the claims of the present application, let alone the use of such a transesterified product as a reactive polyol component in forming a urethane material. Such a transesterified polyol has further enhanced hydroxyl functionality.

Accordingly, Appellants submit that the obviousness rejections under 35 U.S.C. § 103(a) are unfounded and should be withdrawn, and claims 83 through 108 of the present application be allowed. The prior art applied by the Examiner simply does not disclose or suggest the claimed transesterified product produced from the particular blown vegetable oils and another polyol or the use of such a transesterified product (polyol) as a reactive component used to produce a urethane material.

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Item (11):

The Examiner cites no related proceedings.

Respectfully submitted,

December 14, 2010
Date



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